REMARKS

Claims 1 to 10 are pending.

Claims 1 to 5 are amended.

Claims 6 to 10 are withdrawn from consideration pursuant to a Restriction Requirement.

Claim Rejections - 35 U.S.C. § 103:

Claims 1 to 3 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Okada et al. (U.S. Patent No. 4,739,007) in view of Christiani et al. (U.S. Patent No. 5,747,560). The rejection is respectfully traversed.

Claim 1 is amended to more clearly distinguish the instant invention from the prior art of record. In particular, independent claim 1 specifies, *inter alia*, that at least some of the reinforcing particles are about 20 to 30 layers thick.

This amendment was performed to disclaim the range specified by the prior art and to establish non-obviousness of claim 1.

Okada et al. discloses a composite material comprising a polymer matrix containing polyamide and layers of a silicate uniformly dispersed in the order of molecules in the polymer matrix, each of said silicate layers being 7 to 12 Å thick, the interlayer distance being at least 20 Å. The process taught by Okada et al. yields finely dispersed silicate (clay) layers in the order of magnitude of molecular dimensions (in a thickness of about 10 Å corresponding to about 1 layer) that are firmly combined with the chains of the intercalated polymer. Furthermore, it is noted that the composite material disclosed by Okada et al. is obtained by reacting the polymer in place, *i.e.*, the polymer is grown in the filler particles. The instant invention discloses a physical blending of a thermoplastic material and reinforcing particles.

Christiani et al. requires that the reinforcing particles are exfoliated and not more than up to about 10 layers thick (col. 6, lines 56-64; col. 21, lines 58-66). It is generally accepted in the prior art that the preparation of nanocomposites requires extensive delamination of the layered clay structure and complete dispersion of the resulting platelets throughout the polymer matrix. Thus, in accordance with the prior art, an exfoliated nanocomposite, wherein the layered mineral swells so much that it is

no longer organized into stacks, is the most desirable structure. Therefore, the prior art discloses methods to improve exfoliation to achieve complete or almost complete exfoliation. However, usually very strong electrostatic interactions between silicate layers through intergallery cations make it extremely difficult to achieve complete exfoliation of the layers. Therefore, the prior art discloses efforts to avoid this difficulty and to achieve complete exfoliation of the particles through the development of a compatibilizer chemistry as a key factor in the expansion of this nanotechnology, for example, by replacing such cations by some quarternized ammonium salts.

As explained in the previous responses and in accordance with the invention, exfoliation of the layered mineral particles into constituent layers does not need to be as complete as the references of record require. Specifically, amended claim 1 specifies that at least some of the reinforcing particles are about 20 to 30 layers thick. This limitation is introduced to disclaim the range disclosed by Christiani et al. and to establish non-obviousness In addition, Applicant submits, that support for this limitation can be found in the specification and claims as originally filed wherein it is stated that at least 50% of the reinforcing particles are less than about 20 layers thick and at least 99% of the reinforcing particles are less than about 30 layers thick. In other words, at least some of the reinforcing particles are about 20 to 30 layers thick.

Thus, Applicant submits that the limitation wherein at least some of the reinforcing particles are about 20 to 30 layers thick would not have been obvious to one having ordinary skill in the art.

Furthermore, claim 1 is amended to claim a reinforced *low pressure compression* molded article. Okada et al. merely discloses a composite material and a process for making such a composite material. Christiani et al. teach molding the composite into a variety of articles, such as sheets and panels. However, Christiani et al. discloses only conventional shaping processes, such as melt spinning, casting, vacuum molding, sheet molding, injection molding, and extruding (col. 24, lines 9-14). However, Christiani et al. does not disclose low pressure compression molding of the composite.

Compression molding is typically applied for the processing of complex contour parts. It provides good surface control and definition on both sides of the molded part. Compression molding is the main processing method used with thermoset resins but can also be applied to thermoplastics.

In accordance with the instant invention as defined in amended claim 1, a reinforced low pressure compression molded article is disclosed comprising a protrusion integrally molded with the main portion and protruding from one of the surfaces, the protrusion having a thickness of less than the thickness of the main portion and less than about 0.1". The protrusion has a height of at least twice the thickness of said protrusion.

Conventional reinforced low pressure compression molded articles using glass fibers, for example, needed to be made with relatively thick protrusions since glass fiber reinforcements inhibit substantial flow of the molten material. As a result, the fibers do not align with the longitudinal direction of the protrusions, and an insufficient amount of glass fibers will enter into protrusions of thicknesses of 1/10" or less. Thus, these protrusions would need to be made thicker, or otherwise not be reinforced to the extent desirable. The protrusions in accordance with the instant invention are integrally molded with the main portion of the article to be used as structural supports, for example to mount speakers, as stiffening ribs, as bosses to provide supported or reinforced holes to hold or receive fasteners, or as dog house structures to secure other structures to the article. Thus, thin, reinforced molded-in inserts for screws, bearings, or other attachments in automotive trim may be produced by low pressure compression molding according to the invention. Reinforced bosses or other hollow circular standoffs into which a screw can be thread may be made as well. Reinforced bosses having small ribs for even greater reinforcement may also be made in accordance with the invention. Stiffening ribs may be integrally molded into automobile interior trim according to the invention. Ribs forming hooks may be reinforced according to the invention. All such integrally low pressure compression molded, reinforced protruding elements have a thickness of less than 1/10 inch and extend from a primary trim portion or body. Thus, the present invention teaches structural elements that enhance the functional mechanical performance of the reinforced low pressure compression molded articles.

The Office Action states that embossing as disclosed by Christiani et al. (col. 24, lines 45-50) would produce the recited protrusions in claim 1. Christiani et al. merely mentions that the surfaces of the sheets and panels may be in the embossed form. No further disclosure as to the height and thickness limitation, as well as to the particular molding process are being made. Applicant respectfully traverses the statement that the features of the protrusion are merely dependent on the end use and

easily determined by one of ordinary skill in the art. As discussed heretofore, in accordance with the instant invention as defined in claim 1, protrusions are integrally low pressure compression molded with the main portion of the article. These protrusions can be made thinner than prior art protrusions in low pressure compression molding. The reinforced protrusions have a thickness of less than 1/10 inch and extend from the main portion of the article.

Christiani et al. provides no disclosure of low pressure compression molding reinforced articles from composite materials. Furthermore, Christiani et al. does not disclose a protrusion integrally molded with the main portion of the article.

In view of the foregoing, it is respectfully submitted that the combination of Christiani et al. and Okada et al. does not teach all the claim limitations, as recited in claim 1. Further, even if the combination of Christiani et al. and Okada et al. taught all the claim limitations, there is no motivation to combine the teachings of Christiani et al. and Okada et al. to meet the claimed invention. Thus, Applicant submits that claim 1 is not obvious in view Christiani et al. and Okada et al. and requests that the rejection be withdrawn. Claims 2 and 3 which ultimately depend from claim 1 are likewise submitted to be allowable for at least the reasons above. Withdrawal of their rejection is respectfully requested.

Claims 4 and 5 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Okada et al. (U.S. Patent No. 4,739,007) in view of Christiani et al. (U.S. Patent No. 5,747,560) as applied to claim 1, and further in view of Simm et al. (U.S. Patent No. 4,447,488). The rejection is respectfully traversed.

Claims 4 and 5 ultimately depend from claim 1 and are likewise submitted to be allowable for at least the reasons above. Withdrawal of their rejection is respectfully requested.

In view of the foregoing, it is respectfully submitted that the Application is in condition for Allowance. Favorable consideration and prompt Allowance of the Application is earnestly solicited.

Should Examiner Salvatore believe anything further would be desirable in order to place the Application in better condition for Allowance, the Examiner is invited to contact the undersigned attorney at the telephone number listed below.

Please charge any fees associated with the submission of this paper to Deposit Account Number 033975. The Commissioner for Patents is also authorized to credit any over payments to the above-referenced Deposit Account.

Respectfully submitted,

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